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Prairie farm rehabilitation and related activities

ANNUAL REPORT

CANADA DEPARTMENT OF AGRICULTURE

1965

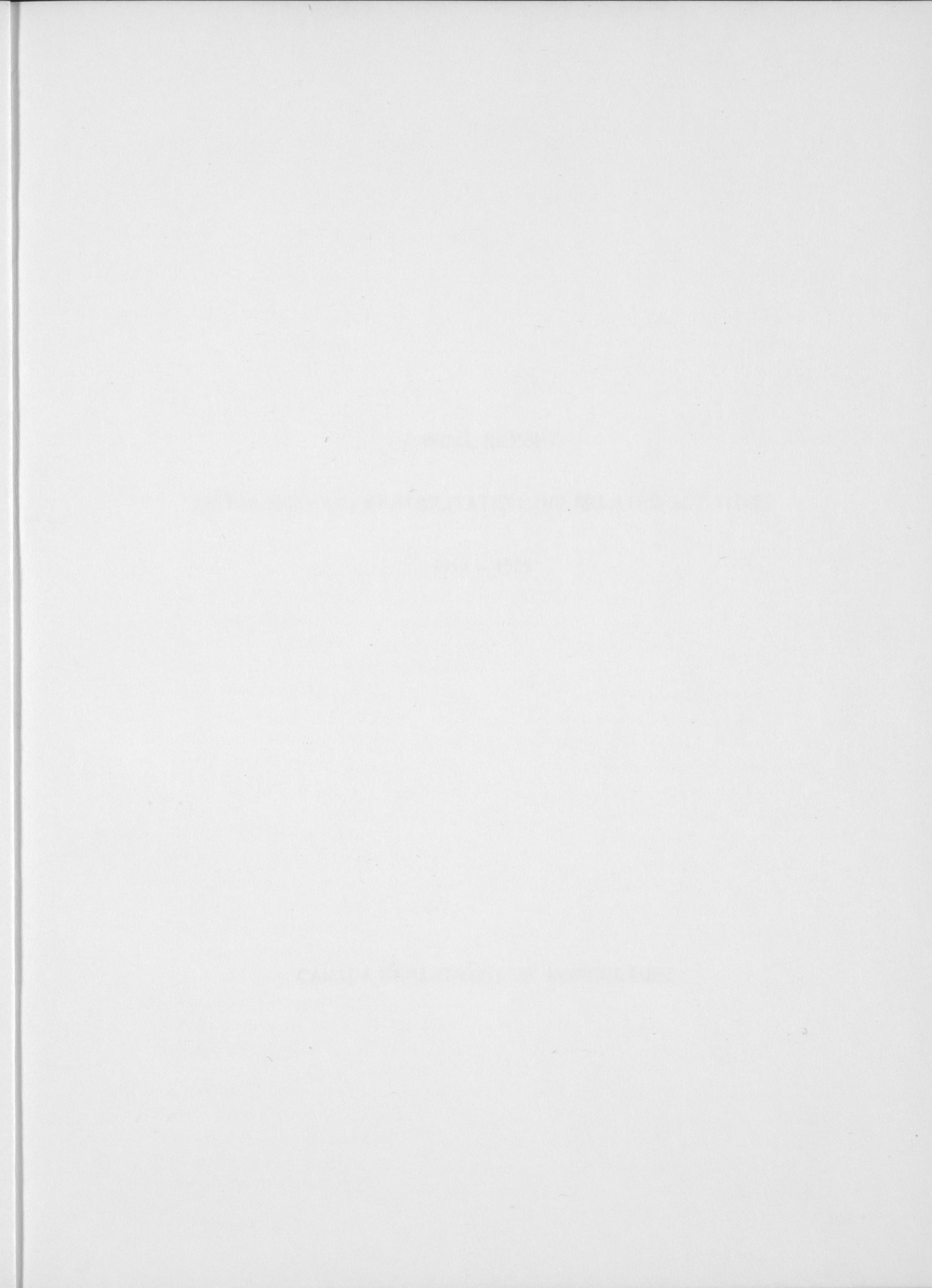
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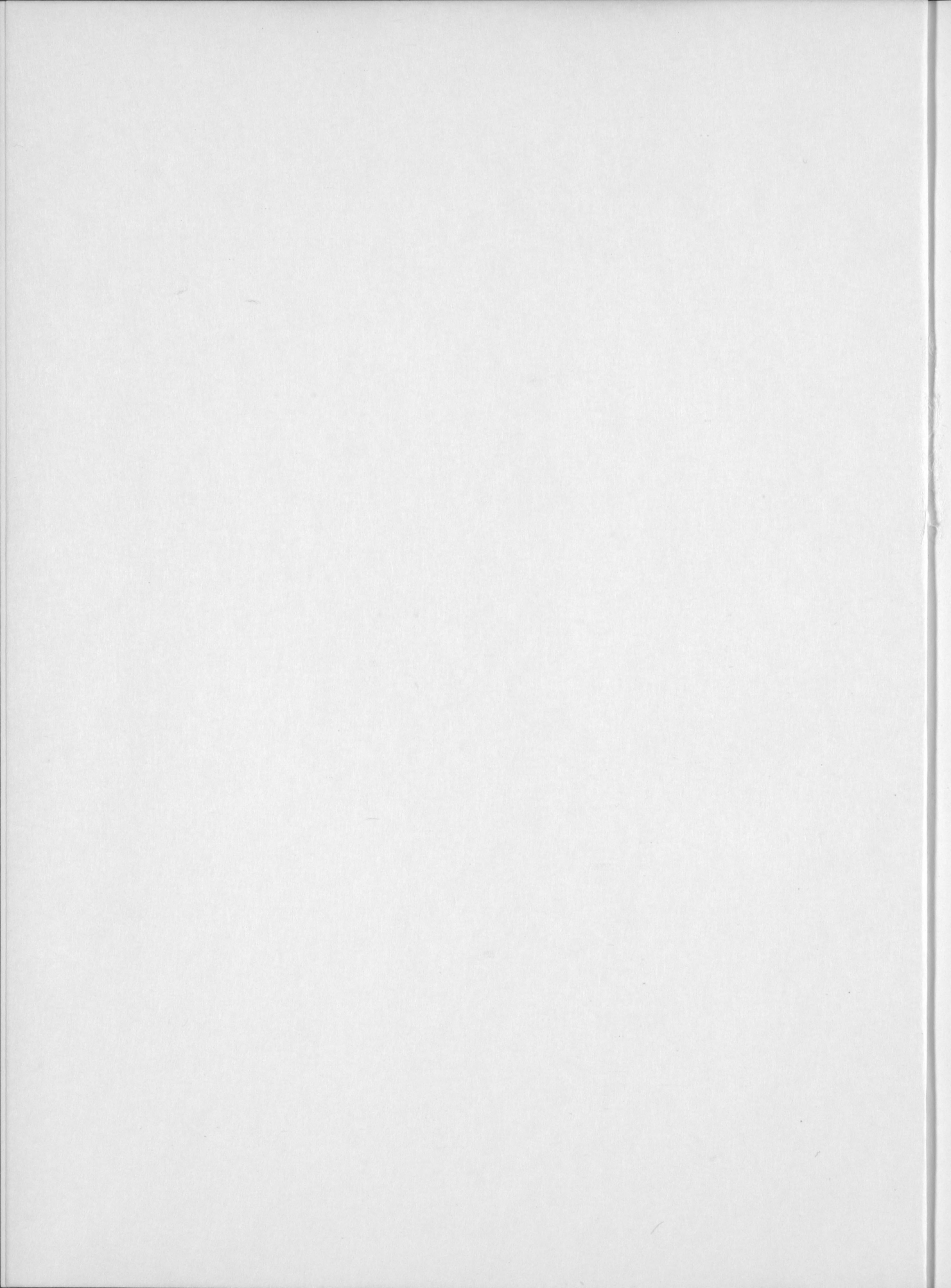
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1964 - 1965

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ANNUAL REPORT

ON PRAIRIE FARM REHABILITATION AND RELATED ACTIVITIES

1964 - 1965

CANADA DEPARTMENT OF AGRICULTURE

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INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by Parliament in 1935 to provide a four-year program for the rehabilitation of drought and soil-drifted areas of Manitoba, Saskatchewan and Alberta. By amendment in 1937, land utilization and resettlement were included, and in 1939 the Act was extended indefinitely.

Land use and water conservation on individual farms were originally the main activities qualifying for assistance under the Act, and are still important in the PFRA program. However, PFRA responsibilities over the years have expanded to include development of large-scale irrigation and reclamation projects, and a broad program of community pastures.

Other significant changes in the scope and functions of PFRA have occurred in recent years. In 1961, the program was extended to include all agricultural areas of the Prairie Provinces.

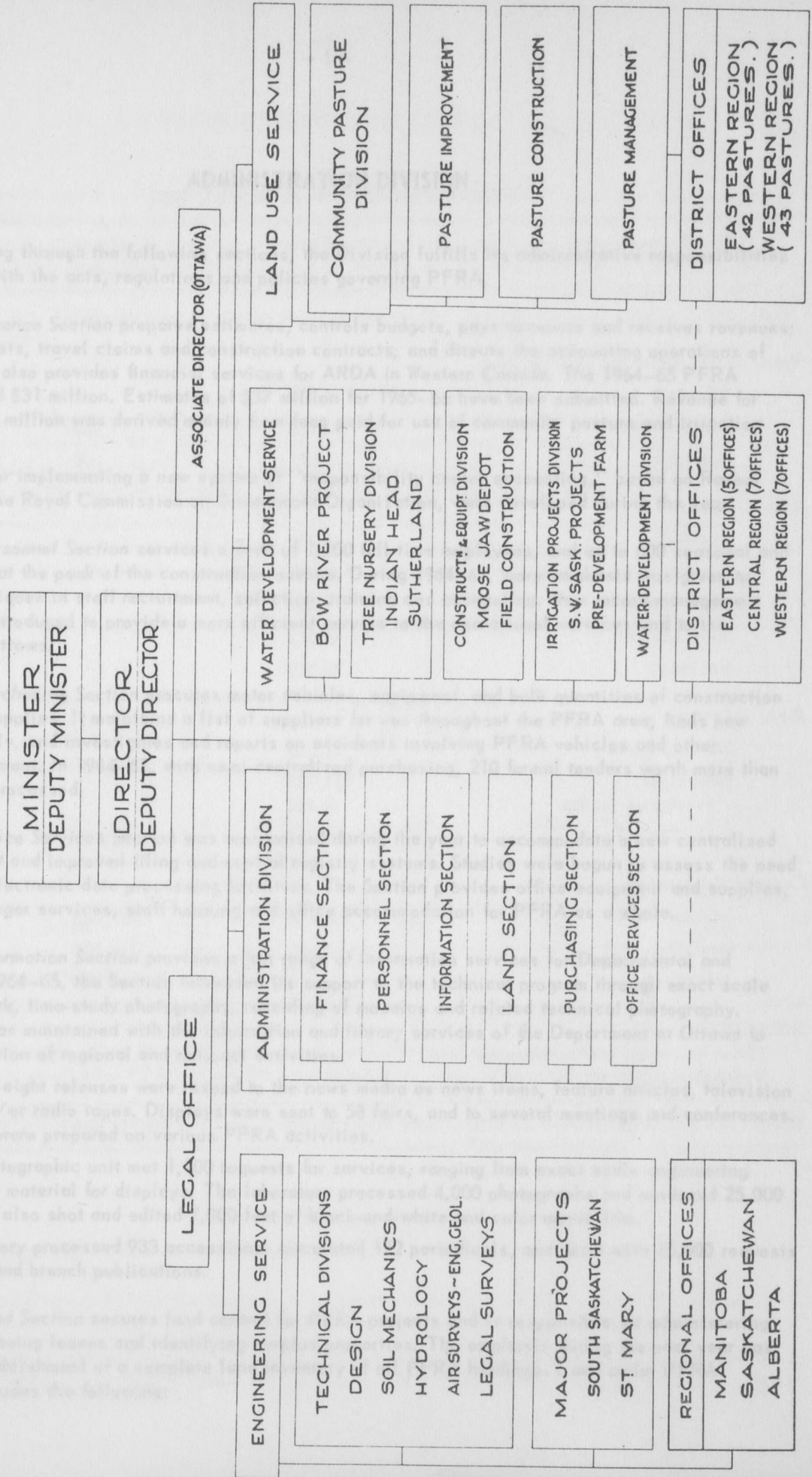
In 1963, the federal tree nurseries at Indian Head and Sutherland, Sask., were transferred to PFRA from the Research Branch. All aspects of the extensive tree-distribution program now are performed by PFRA.

PFRA also assists in administering and providing technical services for the Agricultural Rehabilitation and Development Act in Western Canada.

The following is a summary of activities of the Prairie Farm Rehabilitation Administration for the fiscal year ending March 31, 1965.

P.F.R.A ORGANIZATION

MARCH 31, 1965



ADMINISTRATION DIVISION

Operating through the following sections, the Division fulfills its administrative responsibilities in accordance with the acts, regulations and policies governing PFRA.

The Finance Section prepares estimates, controls budgets, pays accounts and receives revenues; processes paylists, travel claims and construction contracts; and directs the accounting operations of field offices. It also provides financial services for ARDA in Western Canada. The 1964-65 PFRA budget exceeded \$31 million. Estimates of \$37 million for 1965-66 have been submitted. Revenue for the year of \$2.1 million was derived mainly from fees paid for use of community pasture and irrigation facilities.

Plans for implementing a new system of "responsibility center accounting," based on Recommendations of the Royal Commission on Government Organization, were developed during the year.

The Personnel Section services a staff of 1,200 full-time employees, and up to 600 seasonal and casual workers at the peak of the construction season. During 1964-65, more emphasis was given to improving techniques in staff recruitment, selection, training and counseling. New record-management systems were introduced to provide a more efficient service to the operational services and to the Department at Ottawa.

The Purchasing Section procures motor vehicles, equipment, and bulk quantities of construction materials and supplies. It maintains a list of suppliers for use throughout the PFRA area, finds new sources of supply, and investigates and reports on accidents involving PFRA vehicles and other motorized equipment. In 1964-65, with semi-centralized purchasing, 210 formal tenders worth more than \$900,000 were processed.

The Office Services Section was reorganized during the year to accommodate a new centralized transcribing unit and improved filing and central registry systems. Studies were begun to assess the need for record and electronic data processing facilities. The Section provides office equipment and supplies, mail and messenger services, staff housing and office accommodation for PFRA as a whole.

The Information Section provides a full range of information services for Departmental and public use. In 1964-65, the Section increased its support to the technical program through exact scale reproduction work, time-study photography, rescaling of mosaics and related technical photography. Close liaison was maintained with the information and library services of the Department at Ottawa to ensure coordination of regional and national activities.

Seventy-eight releases were issued to the news media as news items, feature articles, television film scripts and/or radio tapes. Displays were sent to 58 fairs, and to several meetings and conferences. Four brochures were prepared on various PFRA activities.

The photographic unit met 1,100 requests for services, ranging from exact scale engineering reproductions to material for displays. The laboratory processed 4,000 photographs and produced 25,000 prints. The unit also shot and edited 7,000 feet of black-and-white and color movie film.

The library processed 933 accessions, circulated 172 periodicals, and dealt with 15,000 requests for information and branch publications.

The Land Section secures land control for PFRA projects and is responsible for administering land records, issuing leases and identifying surplus properties. The emphasis during the past year has been on the establishment of a complete land inventory of all PFRA holdings. Land under PFRA jurisdiction includes the following:

LAND INVENTORY ON MARCH 31, 1965

Projects	Title	Easement, lease, etc.	Total
		(acres)	
Water conservation and reclamation:			
Alberta	198		
Saskatchewan	14,742	1,969	
Manitoba	3,618	88	20,615

Minor irrigation:			
Eastend	5,830		
Cypress Lake	5,349		
Maple Creek	11,005		
Swift Current	16,362		
Val Marie	10,502		49,048

Major irrigation:			
St. Mary River	13,766		
Bow River	121,135		
(exchange lands)	9,468		
South Sask. River	66,450	59,954	270,773

Community pastures:			
Saskatchewan	1,193,834	567,148	
Manitoba	4,609	446,103	
Alberta		142,720	2,354,414

Miscellaneous:			
(Tree nurseries, pre-development farm, hydrometric site, etc.)	1,234		1,234

Total	1,478,102	1,217,982	2,696,084

WATER DEVELOPMENT SERVICE

This Service provides financial and technical assistance for construction of farm and community water-conservation projects, as well as for large water-storage and irrigation works where there is a special need. It also administers irrigation projects owned and operated by the federal government in southwestern Saskatchewan. The Bow River project in Alberta and the Irrigation Demonstration Farm at Outlook, Sask., are administered by the Water Development Service, as are the Construction, Equipment and Supply Division, which operates a service depot at Moose Jaw, and the tree nurseries at Indian Head and Sutherland, Sask.

Field Services

Light runoff (only about five days) occurred throughout most of the PFRA area in the spring of 1964. A large percentage of PFRA community storage reservoirs did not fill and many farm dugouts and dams also started the summer season at a low level. Thunderstorms in June and July helped replenish some reservoirs. No emergency maintenance was required, freeing staff for a heavy construction program.

Activity continued to increase in northern areas as farmers showed a greater awareness of the PFRA program, which has been available to the northern part of the Prairie Provinces since 1961. Numerous requests for field services came from the North Battleford and Dauphin regions, and several large storage projects were investigated in the Melfort area.

The following table indicates the field services provided in 1964-65.

Type of project	Preliminary calls	Inspections Final	Other	Number of surveys	Plans prepared	Total services
Dugouts	2,216	3,538	942	-	-	6,696
Stockwatering dams	525	318	780	469	406	2,498
Irrigation	722	209	1,021	365	302	2,619
Community	291	82	974	147	52	1,546
Combined	3,754	4,147	3,717	981	760	13,359

Total expenditure on individual projects: \$861,324

Total expenditure on small community projects: \$150,176

Dugout Pumping. This program continued where there was a distinct need and where supplementary water was available. PFRA filled 388 farm dugouts by pumping 86 million gallons of water.

Emergency Community-well Drilling. Eighteen wells were drilled in Saskatchewan and one in Alberta. Total cost was \$41,288 for an average cost per well of \$2,170. The federal government's share was \$16,576.

Large Water-storage Projects

Construction was carried out on 10 large projects, as follows:

Arborfield Dugout. This is the first of two structures to be built on this project. The second is a storage dam, on which the only work completed has been the clearing of brush in the reservoir area.

The dugout is adjacent to Burntout Brook, 1 mile southwest of Arborfield, Sask. Surrounded by earth dykes, it holds 30 acre-feet of water, half of which is fed by natural flow through a 30-inch culvert

leading from a diversion on the brook. Storage may be increased to 50 acre-feet by auxiliary pumping. The dugout, which was completed in 1964, may be recharged during natural runoff or by releases from the upstream storage to be constructed. The project will supply domestic and stockwatering requirements.

Avonlea Creek Storage. This project consists of a dam and reservoir on Avonlea Creek about 35 miles southeast of Moose Jaw. The reservoir, with a capacity of 6,000 acre-feet of water, will increase water supplies for small-scale irrigation and replenish stockwatering facilities through 60 miles of stream channel. The dam is 45 feet high and has a drop inlet spillway, a riparian outlet and an emergency earth spillway. Construction began in 1962 and was completed in November 1964.

Chain of Lakes (Willow Creek) Project. Construction of the Chain of Lakes Project in Alberta began late in 1964. It consists of two earth-filled dams, one on Willow Creek at the south end of the Chain of Lakes and the other at the north end on Stimson Creek. The larger south dam will have a reinforced concrete spillway and both dams will have gated outlets.

The main dam is about 10 miles south and 20 miles west of Nanton, Alta. It will be 44 feet high and 1,730 feet long, with a capacity of 14,000 acre-feet of water. The project is to provide water for the town of Claresholm, for supplementary irrigation of 11,000 acres of land, and for other local needs.

Conjuring Creek Project. Conjuring Creek is a tributary of the Assiniboine River. Between May and September, 1964, an earth-filled embankment 25 feet high and 900 feet long was built on this creek 2 miles northwest of Russell, Man. The reservoir created will hold 1,000 acre-feet of water, which can be released downstream for stockwatering and for domestic use in Russell. It has a drop inlet spillway. An emergency spillway has also been provided.

Fairview Project - Plato Dam. This project, on a coulee about 15 miles east of Eston, Sask., consists of a compacted earth dam 42 feet high, with drop inlet and emergency spillways. The reservoir created by the dam will hold 400 acre-feet of water for domestic use, stockwatering and weed spraying. Construction was completed in November, 1964.

Mossy River Dam. The northern outlet from Lake Dauphin in west central Manitoba is the Mossy River. A stop-log control dam was built immediately north of the lake shore between May and August, 1964. The structure is of reinforced concrete and has 10 stop-log bays. It is 225 feet long, and 13 feet from the stilling slab to the top of the piers. Water stored by the dam will be used for stockwatering and recreation.

Pilot Mound Dam. Late in 1964 a contract was awarded for construction of an earth-filled dam 2½ miles east of Pilot Mound, Man. When completed in 1965, it will be 500 feet long and 28 feet high with drop inlet and emergency spillways and a gated conduit to regulate low flows. During the winter the contractor cleared the bed of the reservoir, which will store 450 acre-feet of water for domestic use, stockwatering and, possibly, irrigation.

Ste. Rose Dam. The Turtle River carries most of the runoff from the northeastern slope of Manitoba's Riding Mountains to Lake Dauphin. The village of Ste. Rose du Lac is on the river about 6 miles upstream from the lake. A contract was awarded in October, 1964, for construction of a reinforced concrete stoplog control dam just south of the village to provide for stockwatering and domestic needs. This dam is 25 feet high from floor slab to top of piers and has five bays. By enclosing the work area with plastic sheeting, it was possible to work throughout the winter and the dam was completed before the March 31 deadline.

Theodore Dam. Located on the Whitesand River 25 miles northwest of Yorkton, the Theodore Dam rises 45 feet and can store 12,000 acre-feet of water. Agricultural and domestic needs along 40 miles of the river channel in two municipalities will be served. The dam is protected by a concrete chute spillway. Construction began in 1962 and was completed in September, 1964.

Welwyn Community Storage. The Welwyn Dam is on Beaver Creek, a tributary of the Assiniboine River, about 15 miles northwest of Moosomin, Sask. The project consists of a 25 foot high dam, drop inlet spillway, riparian outlet and emergency earth spillway. The reservoir has a capacity of 400 acre-feet and will provide water for domestic and stockwatering needs in parts of Saskatchewan and Manitoba. Construction was carried out in 1964 under contract. PFRA crews cleared the reservoir and improved the channel below the dam.

Kindersley-Eston Pipeline Project. A contribution of \$50,000 was made in 1964 toward the cost of installing rural water outlets along a newly constructed pipeline that supplies water from the South Saskatchewan River to the towns of Kindersley and Eston. PFRA helped finance the project to ensure a water supply to farms along the 40-mile length of pipeline that passes through an area unsuitable for surface water reservoirs and where runoff is unreliable. The amount contributed by the federal government was based on an estimate of the cost of developing community water reservoirs that would provide comparable benefits. The water outlets are expected to serve about 300 farmers, within a 10 mile radius of the pipeline, who have found it difficult to obtain adequate supplies of water for livestock.

Irrigation Projects

PFRA developed all projects described in this section and operates and maintains them.

Rehabilitation, Southwest Saskatchewan

PFRA has six irrigation projects in this area: Val Marie, West Val Marie, Eastend, Consul, Maple Creek and Swift Current. In these six, 25,000 acres of land have been developed for irrigation and water is supplied from 25 reservoirs. Eight other major irrigation projects containing about 15,000 acres are operated by the province or under private lease and receive water from the PFRA reservoirs.

Most of the projects operated by PFRA are about 25 years old. Their main purpose is to produce forage for winter feeding of range cattle and to maintain breeding herds.

In 1964, several canals were lined to stop seepage and 1,534 acres of land were leveled in the continuing improvement program to combat alkaline soil conditions and increase production. Leveling has doubled and tripled production on large irrigated acreages despite some water shortages.

Farmers on the projects are being encouraged to form water-users' associations, so that they can accept responsibility for operating the projects at some future date. Water rates between 1964 and 1968 will be increased gradually from \$2 to \$3. These charges and improved crop production are expected to encourage farmers to take over and run the projects.

Bow River Project

Water was available for irrigation from May 21 to October 20. Consumption of water rose to 108,000 acre-feet from 92,000 acre-feet in 1963. Diversion from the Bow River was continued during the fall to ensure sufficient water in project reservoirs for irrigation in 1965.

All laterals and drains were sprayed with herbicides to control weeds, and Aqualin was again used experimentally to control submerged aquatic weeds.

Soil drifting filled $3\frac{1}{2}$ miles of laterals, which had to be cleared before water could be delivered. The farmers involved were asked to practice better farming methods.

No new major works were built but PFRA continued to replace wooden field structures with concrete structures. Considerable work, lining canals with polyethylene and installing tile drains, was carried out to control water loss and land damage by seepage. This continuing program must be scheduled when weather permits, before or after the irrigation season. In providing additional drainage outlets for farm units, $22\frac{1}{2}$ miles of open drain were excavated.

Leveling in the Hays community pasture was completed on another 300 acres, making a total of about 1,000 acres of irrigated pasture that has been improved.

Agricultural Operations. Periodic unfavorable weather conditions kept production per acre of most vegetable crops below normal, but overall production was higher than usual due to increased acreages of specialty crops. The main increases were in green peas and potatoes, the latter bringing record prices. These high prices caused the potato starch plant at Vauxhall to suspend operations for the balance of the year.

The hay acreage was reduced from previous years because of low prices. However, yield and quality were above normal and, due to the long cold winter, all hay in the district was sold at a good price.

Settlement. The number of settlers in the Hays area was reduced during the year to 136 families, as six of the original settlers sold or transferred their holdings.

Only two fencing loans, totaling \$2,219, were approved under the arrangement to lend money for buildings, materials, livestock and fencing. Total repayable loans under this program were \$159,226 at December 31.

Irrigation Demonstration Farm

A wide variety of grain, hay and row crops were grown under varied techniques at the Irrigation Demonstration Farm, Outlook, Sask. The purpose of this continuing program is to show the types of irrigated crops that can be economically produced in the area and the best methods of irrigating them.

Specialty crops grown included potatoes and corn and yields were good. Brome-alfalfa was the best producing hay crop, yielding more than 4 tons per acre.

The mechanical grazing trials started in 1961 were continued, as were the natural grazing operations on irrigated pasture.

The livestock program in 1965 will be conducted in cooperation with the Animal Science Department of the University of Saskatchewan. It will include mechanical grazing studies and an economic analysis.

Project Maintenance and Construction

A regular staff of 74 was employed by this section, with casual help hired as required.

The PFRA Equipment and Supply Depot at Moose Jaw made repairs ranging from minor repairs to vehicles and trailers to major overhaul jobs on heavy equipment. The 428 jobs completed cost \$131,504 plus labor. The trade shops manufactured 345 items including trailers, signs, water troughs and special equipment. Most repair and manufacturing work was done during the winter to employ construction staff when outside work was closed down.

Construction crews worked on 126 projects with the cost of materials and supplies amounting to \$130,882. Pasture service crews filled an additional 116 work orders at a cost of \$15,205. Painting in five pastures entailed an additional expenditure of \$8,079.

The transport fleet made 369 trips, hauling 5,743 tons 180,091 miles. Seventy percent of this work was for the Community Pastures Division.

Tree Nursery Stations

The tree nurseries at Indian Head and Sutherland distributed 8,697,000 deciduous and 151,000 coniferous tree seedlings and cuttings to 9,266 farms during 1964. This is 40 percent more than in 1963 and is the largest distribution ever achieved. New mechanical packing equipment and a new packing shed increased efficiency of distribution by 76 percent.

Seedlings were distributed to farms as follows: 78.7 percent to Saskatchewan, 18.8 percent to Manitoba, 2.4 percent to Alberta and 0.1 percent to the Peace River region. Of the total production of seedlings, 47 percent was used for planting 1,138 miles of field shelterbelts, 46 percent for home shelterbelts, and 7 percent for federal, provincial and municipal plantings.

The field season lasted from April 16 to November 18. The land area under production was expanded further by clearing and breaking old plantations.

LAND USE SERVICE

A 1937 amendment to the Prairie Farm Rehabilitation Act provided for the removal of submarginal land from cereal crop production, and the reclamation of such lands for grazing by seeding it to grass and otherwise developing it for community pastures. Since then, continuous growth has earmarked the community pasture program. In 1964, the opening of eight new pastures brought the total to 83, with a fenced acreage of 2,314,077 acres. During the year, 7,206 patrons grazed 156,299 cattle and calves, 323 horses, and 1,800 sheep in the pastures.

There are seven districts under the program, with supervisors at Regina, Weyburn, Swift Current, Kindersley, Saskatoon, Dauphin and Brandon.

Pasture Operations

The spring of 1964 was one of the driest on record for both precipitation and runoff. Low water levels at the close of the 1963 grazing season contributed to the water shortage, particularly in pastures in southwest Saskatchewan. The grass carryover at the end of 1964 grazing was less than normal, but should not seriously reduce carrying capacities.

Of the eight new pastures operating this year, two are within the boundaries of Indian reserves. This is the first time reserves have been used for organized grazing on a cost-per-head basis. The Cowessess-Sakimay pasture carried 1,317 cattle and calves, and 1,159 animals were grazed in the Ochapowace-Kahkewistahaw pasture. Other new pastures and the numbers of animals grazed were as follows: Duck Mountain 744, Hazel Dell 1,249, Lenswood 632, Narcisse 423, Pasquia 128 and Spiritwood 279.

Grazing Allocations and Fees

PFRA assumed responsibility for allocating grazing privileges in 1964. This previously was handled by local advisory committees. Allocations are based on individual need, nearness to pasture and past patronage. A productive-man-work unit score is used in assessing each farmer's need. The PFRA allocations are reviewed and approved by the local advisory committees before grazing permits are issued. Each patron must pay \$2 per head for cattle and horses to validate his permit. Present grazing rates include a tax levy of one cent per head per day to reimburse the municipality or local improvement district for loss of tax revenue on community pasture lands. Per-head fees for 1964 were:

- Cattle - 6 cents per day (including one cent tax levy)
- Calves - \$4 per season (sucking with dam, born before August 1)
- Horses - 8 cents per day (including one cent tax levy)
- Colts - \$5 per season (sucking with dam, born before August 1)
- Sheep - 12 cents per month (provide own herder)
- Breeding service - \$5 per cow

Minimum grazing fees per head per season are: cattle \$5, horses \$7 and sheep 40 cents.

Haying and Regrassing

Slough and upland hay crops were very light and some pastures did not harvest any hay. Those that did, including the Bitter Lake Irrigation Project, gathered in 3,931 tons for feeding bulls and head-quarters stock.

Tame grass was sown on 8,055 acres, with 5,508 acres of this going into crested wheatgrass, 600 acres in a mixture of brome and crested wheatgrass, and 1,947 acres in various other mixtures. This brings the total seeded to 188,854 acres.

Fires and Fire Protection

Only one serious grass fire occurred in the pastures in 1964, when railway employees, burning right-of-way, let the fire get away from them. It destroyed 1,550 acres of grass.

Motorized units working out of Moose Jaw maintained 1,136.5 miles of fireguard, and constructed 51.5 miles of road in pastures which serves as fireguard.

Breeding Service

There were 51,013 cows serviced under the pasture breeding program in 1964, of which 3,279 were bred artificially. Natural breeding required 1,744 bulls, 1,294 of them PFRA bulls and 450 rented animals.

Continuing its bull-development policy, PFRA purchased 244 yearling bulls to be developed at the Archie and Bitter Lake pastures, and 150 two-year-old bulls ready for service. The purchases included 376 Herefords, 5 Shorthorns and 13 Aberdeen Angus. A compilation of purchases, sales and casualties since 1963 leaves a balance of 1,314 bulls owned by PFRA.

Bulls are rented to the pastures for \$40 per year per bull. This, plus breeding fees of \$5 per cow, enables the breeding service to operate at cost.

Livestock Diseases

No serious outbreaks of disease occurred in community pastures during 1964. Common disorders such as pinkeye and foot rot responded to treatment. Close liaison with the Health of Animals Branch is maintained to assist in controlling brucellosis and tuberculosis.

Livestock Insurance

Forty-six pastures provided for mutual insurance covering all losses, except those occurring as a result of contagious diseases and parturition, at a cost ranging from 35¢ to \$1 per head. Six pastures were covered by a Saskatchewan Government Insurance policy optional to each patron. Thirty-one pastures had no insurance.

Pasture Construction

Construction involved 215 miles of new fence as several pastures were enlarged, some cross-fenced and 53 others repaired. There are now 5,533 miles of fence enclosing 2,318,000 acres of pasture land. Four sets of corrals, four houses and 19 miscellaneous pasture headquarters buildings were constructed.

Pasture Improvement

Light runoff and precipitation in the spring of 1964 made it necessary to pump water from creeks and large reservoirs via pipelines to rereservoirs and dugouts in some of the pastures, particularly in southwest Saskatchewan.

One dam, 91 dugouts, 32 wells, 9 windmills and 7 pressure systems were constructed for stockwater. In improving and maintaining stockwater facilities, 123 dugouts and dams were enlarged and 140 windmills and troughs moved or replaced.

Other pasture improvements included clearing 18,500 acres, brush spraying 16,000 acres, fertilizing 400 acres, developing 70 acres for irrigation, and preparing 16 miles of fireguard so that brush could be burned without risk of destroying grazing areas.

ENGINEERING SERVICE

The Engineering Service provides engineering for the investigation, planning, design and construction of PFRA water development projects. It also provides technical assistance to the other PFRA services in the operation and maintenance of projects in which Canada retains an interest, and to several interagencies engaged in planning and implementing major works in large river-basin developments of interprovincial or international scope. The major interagencies are the International Joint Commission, the Prairie Provinces Water Board and the Greater Winnipeg Floodway Advisory Board.

The Engineering Service has two major project offices, at the St. Mary and South Saskatchewan River projects, and three regional offices, each serving a prairie province, at Winnipeg, Regina and Calgary. The Service also has five technical divisions: the Design, Hydrology, Air Photo and Legal Surveys divisions are at PFRA headquarters in Regina and the Soils Mechanics and Materials Division is at Saskatoon.

The offices at the two major projects supervise construction and carry out field planning. The regional offices conduct field investigations and overall project planning, and supervise construction of projects ranging in size from community water storages to major works involving provincial participation. The technical divisions do the detailed planning, designing and other engineering work necessary for implementing projects.

Major Projects

South Saskatchewan River Project

This project, in south central Saskatchewan, will have the largest earthfill dam in Canada. It is a multipurpose, water-conservation project, storing and harnessing the river flow for irrigation, power production, domestic and industrial use, and recreation. The reservoir is being created by constructing two dams. The main dam is on the south Saskatchewan River midway between Outlook and Elbow. The secondary dam is in the Qu'Appelle River Valley.

The costs of development are being shared by the federal and provincial governments according to an agreement signed in 1958. The federal government is responsible for the planning, design and supervision of construction of engineering works required for the reservoir, and pays most of these costs. The Province is responsible for all other phases of development, mainly facilities for irrigation, production of hydro power, and recreation.

Design and Planning. Plans and specifications were prepared and tenders called for six contracts during 1964-65, to construct the following works:

- Stage II of the cathodic protection system for the tunnels;
- Plugging the low level inlets of the tunnels;
- Stage III embankment;
- Reservoir clearing;
- Spillway gates and hoists; and
- Spillway chute and basin.

Engineers also studied various alternatives to improve the stability of the embankment in the area of Coteau Creek, prepared and submitted plans for relocation of the Canadian Pacific Railway in the vicinity of the Qu'Appelle River Dam, and prepared a contract for gate installations at the Qu'Appelle Dam.

Construction. Emphasis in construction of the main dam centered on Stages IV and V of the embankment operations, the spillway crest and plugging the diversion tunnels. Satisfactory progress was maintained on embankment construction, with 72 percent of this work completed by the end of the year. Excavation has amounted to 85 million cubic yards, of which about 57 million cubic yards have been placed in the embankment. Concrete work to date totals 433,000 cubic yards.

During the year, the spillway crest, control shaft superstructures and installation of control gate hoists at the main dam neared completion; trash racks and low level tunnel bulkheads were installed; and satisfactory progress was made in other works, including those covered by the six new contracts mentioned above.

The value of work completed during the year amounted to 17.8 million dollars, bringing the total expenditures to date to 88.6 million dollars. The labor forces averaged 1,200 workmen during the summer. More than 100,000 visitors to the dam made use of the tourist pavilion provided for their convenience.

St. Mary Project

On the St. Mary Irrigation Project in Southern Alberta, construction of works to irrigate about 500,000 acres of land is nearing completion. The main storage reservoirs on the Waterton and St. Mary rivers control the waters of these two rivers and the Belly River to supply water for irrigation requirements.

Canada pays the cost of constructing the main water storage, diversion and supply works and provides all engineering services required to develop the entire project. Alberta is responsible for constructing the water distribution system and for settlement and agricultural development on the project.

Canada operates and maintains the works it has constructed, and delivers water at cost but not exceeding 25 cents per acre-foot. Alberta recovers a portion of its cost through a \$10-per-irrigable-acre levy paid by the farmers involved.

All of the main works have been completed except parts of the Waterton to Belly River diversion canal. Distribution works are in operation to serve 304,000 acres.

Capital cost to the federal government to March 31, 1965, was approximately \$31,275,000, and to Alberta, \$20,559,000. A large part of the federal share, which includes costs of operation and maintenance, is recovered through the water delivery charges.

Engineering and Construction. The Design Division prepared plans for the control works for the Waterton Dam tunnel and structures on the Waterton to Belly River canal. Plans were completed and a report was prepared on the Lethbridge-Coaldale tract. Surveys, planning and designing continued for the distribution systems yet to be built.

Construction at the Waterton Dam included the outlet structure, drainage tunnel, installation of equipment in the main tunnel, and supply and placing of the spillway gates and hoists. A short section of the Waterton to Belly diversion canal was partly completed.

Improvement and Maintenance. Crews carried out maintenance work and minor construction at the St. Mary Dam and constructed drainage works along the main canal.

Operation. Timely rains and a generally cool summer decreased the demand for water during the operating season. About 360,000 acre-feet of water were delivered from the St. Mary Reservoir.

When record floods occurred in June on the three rivers supplying the project, all structures performed satisfactorily and reduced the severity of flooding downstream. Irrigated acreages in the new areas of the project increased substantially to 120,800 acres. The total number of acres irrigated during the year was 240,000.

Regional Offices

Construction was carried out on 10 projects during the year and investigations were conducted on 30 prospective projects. The following is a brief summary of the activities of each regional office. Further details on construction activities are given under the Water Development Service.

Manitoba

The regional engineering office in Winnipeg supervised construction of the Conjuging Creek Project, Mossy River Dam, Pilot Mount Dam and Ste. Rose Dam, as well as clearing of the reservoir area for the Shellmouth Dam on the Assiniboine River. The Shellmouth Dam, with its reservoir for storing 400,000 acre-feet of water, is one of the main works in a complex of projects to regulate the flows of the Assiniboine and Red rivers. The federal and provincial governments are sharing the cost of the projects, with PFRA engineers planning, designing and supervising the construction of the Shellmouth Dam Project. Late in 1964-65, after further topographic surveys and planning of the reservoir, tenders were called for the first stage of embankment construction.

For several years dyking has been carried out along the lower reaches of the Assiniboine River to control floods. During the year, PFRA constructed 2.7 miles of dyke in five locations. Where erosion had occurred, the banks were back-sloped and trimmed for a total distance of 4,200 feet, and protected with 3,500 cubic yards of riprap.

Investigations, ranging from preliminary studies to the compilation of engineering reports, included Birdtail Creek, Birnie Creek, Boyne River, Gilbert Plains Dam, Jackfish Lake Dam, Antler River Storage - Melita area, Valley River Storage, Victor Dam, Pequis and Fisher River Indian Reserve Flood Control, Pembina-Winkler Storage and Irrigation, and the Whitemouth River projects.

Engineers continued to investigate the Wilson Creek watershed, which lies in the Riding Mountain National Park and has a drainage area of 9 square miles. This is part of a study provided under a joint agreement between the federal government and the Government of Manitoba in the northwest escarpment and interlake region. Three projects have been undertaken cooperatively to learn more about flash floods and heavy sedimentation characteristics of many streams originating on the east slopes of the Riding, Duck and Porcupine mountains. They are the Pine River Storage, Icelandic River Improvement and Wilson Creek Experimental Watershed. The first two have been completed and studies are continuing on Wilson Creek watershed. Several installations have been made since 1957 in an effort to determine and evaluate the interaction of precipitation, runoff, sedimentation, soils geology, forest cover, farming practices, climate, wildlife and other factors in the drainage basins of the escarpment. During the year, PFRA maintained the various instruments used in measuring these environmental factors and recorded data.

Saskatchewan

In addition to providing technical assistance on water storage and irrigation works in southwestern Saskatchewan, the regional engineering office at Regina supervised construction and carried out investigations on a wide range of water development projects during the year. They also provided services for special projects in British Columbia.

Construction was supervised on five new projects: the Arborfield, Avonlea Creek, Welwyn and Fairview projects, and the Theodore Dam. The regional office also carried out work on the Buffalo Pound Water Supply Project, which the Government of Canada continues to operate. In 1956, construction was completed on a two-lift pumping complex for raising water from the South Saskatchewan River over the height of land into the headwaters of the Qu'Appelle River. Forty miles downstream the water is stored in Buffalo Pound Lake to ensure supplies for Moose Jaw and Regina, and irrigation of part of the Qu'Appelle River flats. During 1964-65, a total of 21,360 acre-feet of water was pumped. At the end of the season the lower plant was removed, as it was about to be inundated by the rising pool of the South Saskatchewan River Reservoir. No. 2 pumphouse platform was raised 10 feet so that water could be pumped from the reservoir pool as required in 1965. Eventually, when the South Saskatchewan River Project is completed, water will be released from the Qu'Appelle Dam and flow by gravity into the headwaters of the Qu'Appelle River and from there into Buffalo Pound Lake.

Investigations included a reconnaissance survey and mapping of alternative water supply routes from the Qu'Appelle River Dam to the Regina-Moose Jaw Filtration Plant, a distance of some 60 miles; continuing studies on the Alameda Dam located on Moose Mountain Creek; and flood-control studies on Beaver River and Goosehunting Creek in northern Saskatchewan. Also, preliminary reports on investigations to date were prepared for Watson Dam, Helgason Dam and Semerau Dam.

From time to time, the Saskatchewan regional office is requested to furnish services in British Columbia for projects being developed under the Veterans' Land Act and projects sponsored by the provincial government, such as those being financed under the ARDA program.

During the year, PFRA completed a study and compiled a preliminary report for extension of the Penticton-West Bench Project. This work was carried out at the request of the Veterans' Land Act Branch, Department of Veterans' Affairs. Another project was undertaken late in the year, at the request of the British Columbia Government, to renovate the water supply and distribution system for the Penticton Irrigation District. This project is being financed under the ARDA program, with PFRA providing engineering services and supervising construction.

Alberta

The office at Calgary investigated 12 water development projects, operated and maintained the Bow River Project, and supervised construction of the Chain of Lakes Project described earlier.

Regional engineers continued to investigate major storage possibilities at the Gap site and Three River site on the Old Man River, as well as potential storage sites on the Paddle River. Reports on studies of the Pincher Creek Project and the Therriault Project on Indian Farm Creek are nearing completion; and investigations are continuing on the Parlby Creek and Hanna Water Supply, Wabash Creek, Kimball-Pine Pound, Standard, Snake Creek and Mosquito Creek-Little Bow projects.

A comprehensive economic and engineering study of irrigation districts in Alberta was launched in 1964 under ARDA. The objects of the study are to determine the actual cost of operating an irrigation project and to assess the benefits that accrue to the economy through irrigation. Under the terms of the agreement, the study will be carried out in three phases:

An engineering study by PFRA to determine the costs of operating, maintaining and rebuilding the irrigation works.

An economic study by the Economics Branch of the Department to determine the primary benefits of irrigation, that is, the value of production from irrigated land compared with that from dry land in areas having similar soil and climate.

An economic study to determine the secondary benefits of irrigation, that is, how the benefits are distributed among different segments of the economy. This will be carried out by the University of Alberta, Department of Agricultural Economics, which also has the responsibility for bringing the three phases of the study together.

PFRA has carried out surveys and completed a final report on the annual cost-structure of the Eastern Irrigation District, which was chosen as the initial project to be examined in the study.

Technical Divisions

Design

Preference was given to planning, designing, and preparing specifications and plans for contracts on the South Saskatchewan River and St. Mary projects. Complete plans and specifications were prepared for six water development projects - Arborfield, Chain of Lakes, Fairview, Melfort, Pilot Mound and Ste. Rose - and contracts were awarded. Plans were prepared for modifications to the east inlet structure of Cypress Lake, for a temporary pumping platform at Cypress Lake and for raising the pumps at Pumphouse No. 2 on the Buffalo Pound Lake Project.

The Design Division also prepared plans and specifications for modification and improvements to the Condie Reservoir, a Saskatchewan Department of Agriculture project, and the Jackfish Lake Project in Manitoba.

Work is nearing completion on the design of Blood Indian Creek and Ekapo Lake conservation projects, Middle Creek Channel improvements, Elgin Dam and Gilbert Plains Dam. Preliminary engineering studies, including cost estimates, were completed on a flume across Rolph Creek on the Kimball-Pine Pound Canal, renovation of the Bassano Dam and replacement of the Brooks Aqueduct of the Eastern Irrigation District, the Helgason Dam and the Pleasant Valley Dam. Work continued on the Assiniboine River Project, with particular emphasis on the Shellmouth Dam. Considerable design work was done on the Shellmouth conduit.

The Hydraulic Laboratory operated by the Design Division was fully utilized throughout the year, with three major model studies undertaken. They are: modifications to the stilling basin of tunnel No. 4 at the South Saskatchewan River Project; studies on the pier and stop-log structure for the Ste. Rose Dam; and transitions, gatewell and stilling basin for the Shellmouth conduit.

Air Photo Analysis and Engineering Geology

Office air photo site selection and appraisal studies were completed on the more feasible sites for community dams within 16 rural municipalities in west-central Saskatchewan. Similar studies were carried out on Crowfoot Creek, Paddle River and Smoke Creek in Alberta; on Battle Creek and Goose-hunting Creek in Saskatchewan; and on Birdtail Creek and Whitemouth River in Manitoba.

Brief air photo studies were conducted on three areas in northern Alberta proposed as grazing reserves under the ARDA program.

Large-scale surficial geology studies were conducted at two damsites on Birdtail Creek and at one site on the Qu'Appelle River in Manitoba.

Topographic surveys by photogrammetric means were completed on reservoir areas along Connor Creek, Meeting Creek, Parly Creek and Wabash Creek in Alberta; Milligan Creek, Moose Mountain Creek and Swan River in Saskatchewan; and Birdtail Creek in Manitoba.

The 60-mile route for a proposed pipeline or canal from the Qu'Appelle River Dam to the Buffalo Pound filtration plant was mapped. Marmot Creek watershed in Alberta was mapped in part to investigate the feasibility of using aerial photogrammetric techniques for determining alpine snowpack volume. Other mapping assignments included Rolling Hills reservoir in Alberta, local areas along the South Saskatchewan River, and various damsites where maps were required for geological and subsurface investigations. Deep excavations associated with construction of the South Saskatchewan River Dam were mapped in detail to record the geology of drift and bedrock strata.

A total of six photographic flights were made over the South Saskatchewan River Dam to record construction progress.

Work continued on a special program to assist the Prairie Farm Assistance Administration in determining cultivated acreage in 190 Indian reserves in the Prairie Provinces. Mosaics have been completed for 70 percent of the reserves and acreages delineated in 30 percent.

Soil Mechanics and Materials

In foundation investigations during the past year, the Division drilled 34,000 lineal feet of test holes and recovered nearly 10,000 samples on 16 projects. About half of this work was for the South Saskatchewan River Dam.

The main laboratory in Saskatoon handled 15,000 soil and concrete samples, and carried out about 116,000 tests. In addition, field laboratories were in operation at Conjuring Creek Dam and Waterton Dam, and laboratories were set up at the Chain of Lakes and Shellmouth projects.

Results of soils investigations and design studies were summarized in 16 formal reports and 10 letter reports, for which a total of 450 plans were drafted.

Inspection and testing services were supplied to 10 projects under construction. Test apparatus was installed and read to check the performance of structures during and after construction. A continuing program of inspecting completed structures and observing test apparatus was carried out on over 60 projects. Included in this inspection program were special studies on the effect of frost on structures, and observations on the durability of concrete and the performance of riprap.

Hydrology

The number of hydrologic problems referred to the Division for study during the year included 34 on water supply, 35 on flood potential and 41 miscellaneous. Although this was 11 more than in 1963-64, improved analytical techniques developed by the Division in regional hydrologic studies enabled regular staff to handle the extra work.

Acting as Secretariat for the Prairie Provinces Water Board and the Saskatchewan-Nelson Technical Advisory Committee, the Division completed a number of studies of interprovincial water problems. The Hydrometeorological Section was especially busy this year, due to many requests for information from government-sponsored interagency committees evaluating the broad aspects of watersheds.

In cooperation with the governments of Manitoba and Saskatchewan, the Division initiated a study of water supply and demand for the years 1980 and 2000 in the Assiniboine and Qu'Appelle watersheds for the Prairie Provinces Water Board. One important report, *Distribution and Variability of Runoff in Alberta, Saskatchewan and Manitoba*, was completed for the P.P.W.B.; and another, *Outline of Study of the Water Resources of the Saskatchewan-Nelson Basin*, for the Saskatchewan-Nelson Technical Advisory Committee. The Division also prepared several in-service reports on regional small-watershed runoff.

Legal Surveys

As more surveys were required than could be accomplished with the personnel available, some were carried out by contracting with private land-survey firms.

In Alberta, surveys involving reservoirs, roads and drains were carried out for the St. Mary Project, the Bow River Project and small water developments. Five contracts were awarded amounting to \$3,300.

In Saskatchewan, two contracts were let totaling \$20,500. One covered a right-of-way survey for the Saskatchewan portion of the Shellmouth reservoir and the other was for monument reestablishment on the South Saskatchewan River Project.

PFRA surveyors retraced the external boundaries of the Sakimay, Cowessess, Kahkewistahaw and Ochapowace Indian reserves for the Land Use Service, and surveyed pasture boundaries on the Sakimay Reserve. Thirty-seven miles of surveying was carried out on this job.

On the South Saskatchewan River Project, six right-of-way surveys affecting 19 quarter sections were completed and registered, as were surveys for rebuilding monument in nine townships. Surveys yet to be done in 17 townships on this project will be completed in 1965-66.

Other surveys by PFRA included the Rush Lake subdivisions in the east and west blocks, additional right-of-way on the Herbert main canal, Kindersley-Elma parcel survey, Valeport Flats boundary survey, Tuxford Flood Control Project, Arborfield Community Storage Project (including the reservoir right-of-way and the pumpsite), and Melfort Community Storage (including the reservoir right-of-way and road diversions).

A detailed listing of all survey plans on record in the PFRA survey office was completed, and the area of each parcel of land surveyed was calculated. This information was required by the Land Division to implement a new system of keeping land records.

APPENDIX I

WATER DEVELOPMENT PROJECTS COMPLETED AND ASSISTANCE PAID, 1935-65

Types of Project	DUGOUTS		DAMS		IRRIGATION PROJECTS		TOTALS	
	Completed	Assistance \$	Completed	Assistance \$	Completed	Assistance \$	Completed	Assistance \$
MANITOBA								
Individual	16,251	2,188,359.79	341	29,642.88	281	114,422.87	16,873	2,332,425.54
Neighbor	76	21,407.27	16	5,024.00	19	11,994.24	111	38,425.51
Small Community	8	13,044.66	25	134,401.87	2	30,582.54	35	178,029.07
Large Water	-	-	32	2,352,228.80	6	617,217.00	38	2,969,445.80
TOTAL	16,335	2,222,811.72	414	2,521,297.55	308	774,216.65	17,057	5,518,325.92
SASKATCHEWAN								
Individual	49,270	7,387,600.95	5,388	560,854.53	2,894	764,557.93	57,552	8,713,013.41
Neighbor	426	135,256.94	61	13,226.84	136	71,612.54	623	220,096.32
Small Community	432	459,680.76	210	1,097,952.03	71	678,905.78	713	2,236,538.57
Large Water	-	-	53	4,836,025.51	36	4,129,910.00	89	8,965,935.51
TOTAL	50,128	7,982,538.65	5,712	6,508,058.91	3,137	5,644,986.25	58,977	20,135,583.81
ALBERTA								
Individual	13,314	2,193,104.01	3,384	408,729.16	1,357	367,645.94	18,055	2,969,479.11
Neighbor	59	21,917.21	16	5,843.50	17	6,567.32	92	34,328.03
Small Community	100	205,040.49	122	771,978.27	55	672,592.47	277	1,649,611.23
Large Water	-	-	6	150,015.00	18	693,004.00	24	843,019.00
TOTAL	13,473	2,420,061.71	3,528	1,336,565.93	1,447	1,739,809.73	18,448	5,496,437.37
GRAND TOTAL	79,936	12,625,412.08	9,654	10,365,922.39	4,892	8,159,012.63	94,482	31,150,347.10

DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES UNDER PFRA, 1938-65

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres per Unit of Livestock	Cost of Operation		Net Operating cost per Unit of Livestock \$	Average Charge per Unit of Livestock to Farmers \$
						Revenue \$	Operating Costs \$		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.82
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.45	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,907.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
1960-61	65	1,896,173	6,254,224.42	122,813	15.4	656,708.97	879,811.85	7.15	5.35
1961-62	68	2,088,704	6,845,655.79	146,672	14.2	860,808.25	1,128,255.75	7.69	5.87
1962-63	71	2,114,412	7,283,657.67	139,643	15.1	871,955.43	1,044,241.41	7.48	6.24
1963-64	75	2,149,292	7,677,379.13	141,723	15.2	1,168,641.26	1,193,820.31	8.42	8.25
*1964-65	83	2,318,477	8,826,041.14	156,978	14.8	1,460,278.94	1,396,513.51	8.90	9.30
						11,348,736.79	11,687,776.05		

A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

* Tax levy not included in revenue (1964-65 levy was \$157,768.02).

APPENDIX III
MAJOR PROJECTS - IRRIGATION, RECLAMATION AND WATER STORAGE
 (Projects by Special Votes of Parliament, Administered by PFRA)
 to March 31, 1965

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	-	-	1,355,582
North-West Escarpment Reclamation Proj. - Riding Mt. Area	Dauphin	Watershed Control	Incomplete	-	-	1,304,460
Fairford River Project	Lake Manitoba	Flood Control	1960	-	-	287,751
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	1960	135,000	-	2,256,388
Shellmouth Dam & Portage Diversion	Russell	River Control	Incomplete	-	430,000	935,489
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398
(a) Purchase of Canada Land & Irrigation Company						2,353,182
(b) Development & Construction						21,998,647
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	21,236,133
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	53,901
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	-	58,069
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539
South Thompson - Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	-	200,000

(Above includes ONLY Construction Costs)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	Incomplete	500,000 (Including 24,000 in Qu'Appelle extension)	-	81,093,909
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	-	42,000	2,271,195
- Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	-	-	98,376
(Above includes ONLY Construction Costs)						

APPENDIX III
HYDROLOGICAL EVALUATION AND ANALYSIS

APPENDIX IV
PFRA EXPENDITURES BY ACTIVITIES, 1935-65

ADMINISTRATION DIVISION

Ottawa and Regina Administration	\$ 3,779,327
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LAND USE SERVICE

Cultural Work - Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures - Construction, Operation and Maintenance	27,820,090
Movement of Settlers	227,841

WATER DEVELOPMENT SERVICE

Small Farm Projects	27,350,642
Community, Large Water Storage and Irrigation Projects	22,087,299
Supervision	5,321,757
Equipment - Purchase and Repairs, Service Depot	10,909,721
Tree Nursery Stations	855,968
Bow River Irrigation Project	34,024,910

ENGINEERING SERVICE

Surveys, Design, Soil Mechanics, Drainage Studies, Legal Surveys	
Supervision of Construction	26,089,526
St. Mary Irrigation Project	29,743,892
South Saskatchewan River Project	93,063,752
Assiniboine River Dyking	1,518,712
Shellmouth Dam and Portage Diversion	935,489
B.C. Reclamation and Development, including Lillooet Project	3,310,182
Land Protection and Reclamation, Manitoba and Eastern Canada	4,127,378
Miscellaneous Projects - Construction	4,921,357
	<u>\$301,054,237</u>

REVENUE:

Community Pasture Operations	\$12,024,423
Irrigation Project Operation & General Revenue	6,068,476
	<u>\$18,092,899</u>

[illegible]

3 8 005 809

Date Due

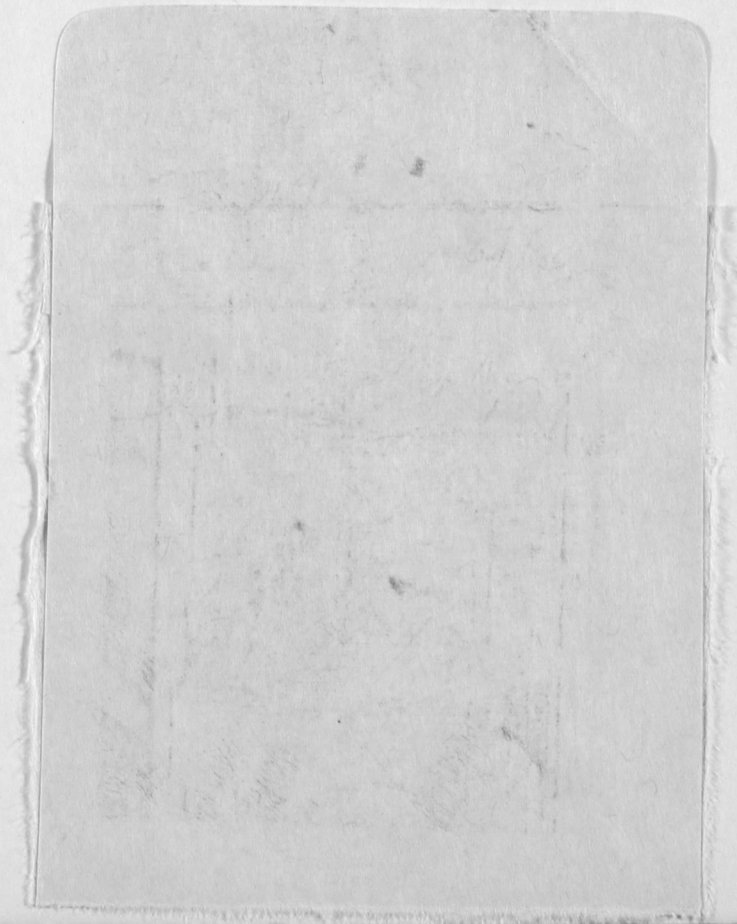
CIRC SE 15 '76

JUN 20 RETURN

HD 1781 A2 P8223 1964/1965
CANADA PRAIRIE FARM
REHABILITATION ADMINISTRATION
ANNUAL REPORT PRAIRIE FARM
40025453 SCI



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